

FOUR NEW CALIFORNIA THYSANOPTERA WITH
NOTES ON TWO OTHER SPECIES

BY DUDLEY MOULTON

Family THRIPIDÆ Uzel

Subfamily THRIPINÆ Karny

Toxonothrips Moulton, new genus

(Toxon = bow)

Head broadly rounded in front, without prominent spines. Ocelli fully developed in female, absent in male. Antenna seven-segmented. Maxillary palpus three-segmented. Prothorax with two long spines on each posterior angle, without spines on anterior angles. Wings fully developed in female, bowed backward in the middle, scythe-shaped, with two longitudinal veins. Wings wanting in male.

I am designating *T. gramineæ* Moulton as the type of the genus.

Toxonothrips gramineæ Moulton, new species

Female, holotype. Color dark brown, abdominal segments two to five lighter, shading gradually to dark brown at tip. Antennal segments one and two dark brown, concolorous with head, three and four light yellowish brown, three a little lighter than four, five lighter at base, outer half of five, also six and seven dark brown. All femora dark brown, middle and hind femora lighter at extreme base. Fore tibiæ yellowish, shaded brown on upper and lower margins, middle and hind tibiæ brown shading lighter at outer ends. All tarsi light yellowish brown. Wings brown with basal one-fifth whitish. Crescents of ocelli deep orange-red.

Measurements: Total body length 1.50 mm. Head, length .175 mm., width .18 mm.; prothorax, length .13 mm., width .225 mm.; mesothorax, width .30 mm.; greatest width of abdomen .33 mm. Length (width) of antennal segments, I, 24 (27) microns; II, 33 (27); III, 48 (21); IV, 51 (18); V, 45 (18); VI, 60 (18); VII, 24; total length 270 microns.

Front of head including compound eyes broadly rounded, almost semicircular. Cheeks arched. All head spines short and inconspicuous. Eyes relatively small, together occupying about .4 the width of the head. Ocelli small but well developed. Mouth cone triangular with blunted tip, reaching about three-fourths across prosternum. Maxillary palpus three-segmented. Antenna seven-segmented, about one and one-half times as long as head. Forked trichomes on segments three and four, simple on segments five and six.

Prothorax with two prominent spines on each posterior angle (45-54 m. long), all other spines inconspicuous; three pair along posterior margin small. All legs slender, tibiæ and tarsi unarmed. Wings fully developed, reaching almost to tip of abdomen, with

anterior margin bowed backward in the middle and posterior margin parallel with anterior margin in median three-fifths of wing; costa with twenty-two spines, fore vein with six (3-2-1) in basal half and three in distal portion, hind vein with ten.

Abdomen broadly ovate with three terminal segments subtriangular. Segment eight with a fully developed but rather sparse comb. Two long strong bristles on each posterior angle of segment nine (inner 120 m., outer 150 m.), a median pair in front of posterior margin (111 m.), a short dorsal median lateral pair (48 m.). Segment ten with dorsal suture over entire length, longest spines weaker than those on segment nine, about 90 m.

Male, allotype. Color about as in female. Total body length .88 mm. Head, length .133 mm., width .133 mm.; prothorax, length .108 mm., width .15 mm.; pterothorax width .166 mm.; greatest width of abdomen .25 mm. Length of antennal segments, I, 24 microns; II, 33; III, 42; IV, 36; V, 33; VI, 48; VII, 18; total length 240 microns. Outer spines on posterior angles of prothorax 24 m.

Apex of head flattened, otherwise shaped as in the female. Spines inconspicuous. Ocelli entirely wanting. Wings wanting. Impressions on ventral side of segments three and four small, oval, not visible on other sternites. Posterior margin of the eighth tergite curved inward and forward from each side to near middle where both sides suddenly turn back to form a prominent median lobe, which reaches almost to posterior margin of ninth segment. Ninth segment with a pair of spines along posterior margin near outer angles (69 m. long), and a second pair of about equal length in the middle of the side margin. Segment ten with a single pair of curved spines 60 m. long.

Described from two females and one male taken from grass sweepings at **Lake Tahoe, California**, in July, 1926, by the writer (Reg. No. 956). All types in author's collection.

This species has the general appearance of a *Limothrips* Hal., but with head broadly rounded in front, without thorns on the ninth tergite and with seven-segmented antenna. If the maxillary palpi were two instead of three segmented, it would more nearly resemble *Baliothrips* Uzel. It differs from *Thrips* Linn., in the broadly rounded apex of the head, the absence of prominent head spines, and differently shaped wings in the female.

***Heliothrips bromi* Moulton, new species**

Female, holotype. With the characters of the genus. Color dark brown with yellowish connecting tissue between segments. Antennal segments one, two, six, seven, and eight dark brown; three and four light yellowish at either end, brown in the middle; five yellowish in basal half, dark brown in outer half. Legs yellow with all femora

and tibiae shaded light brown to brown in the middle. Wings transparent with only a slight shading of brown at extreme tip of fore pair.

Measurements: Total body length 1.23 mm. Head, length .133 mm., width .15 mm.; prothorax, length .12 mm., width .175 mm.; mesothorax, width .225 mm.; greatest width of abdomen .28 mm. Length (width) of antennal segments, I, 15 (24) microns; II, 36 (30); III, 45 (24); IV, 45 (24); V, 36 (21); VI, 27 (18); VII, 15; VIII, 30; total length 246 microns.

Male, allotype. Color as in female. Total body length 1.05 mm. Head, length .102 mm., width .133 mm.; prothorax, length .10 mm., width .18 mm.; pterothorax, width .20 mm. Impressions on sternites three to seven transversely elongate and narrow, and slightly bowed backward in the middle. Two pairs of short stout spines on the dorsal side of segment nine.

Described from twenty-seven female and four male specimens taken by the writer in the Mariposa Big Tree Forest, **Mariposa County, California**, in August, 1926. Host: *Bromus carinatus*, growing under giant redwoods. All types in author's collection (Reg. No. 968).

This species may be distinguished from *hæmorrhoidalis* Bouche by its more slender body, transparent wings except at the extreme tip, and the brown shading in the middle of all femora and tibiae, and from *fasciatus* Linn. by the absence of cross bands on the wings, and by the predominating color of the legs being light yellow shaded with light brown as compared with the dark brown in *fasciatus*.

***Heliothrips gossypii* Moulton, new species**

Female, holotype. Color yellowish brown with darker brown shadings giving a mottled effect. Legs yellowish to brownish white with all femora and tibiae shaded brown in the middle. Antennal segments one and two brown, three and four yellowish brown in the middle and yellowish white at the ends, five yellowish white at the base shading gradually to dark brown, six, seven, and eight dark brown. Wings grayish to yellowish white with three narrow brownish cross-bands in addition to a shading of light brown at extreme base. The first brown band at fork of veins is most conspicuous with more or less brownish gray shading between this and the second band at two-thirds the wing's length. The third band is represented by the darkened tip; hind wings transparent with a darkened median vein. Crescents of ocelli bright reddish orange.

Measurements: Total body length .83 mm. (in normal condition). Head, length .105 mm., width .150 mm.; prothorax, length .084 mm.,

width .17 mm.; pterothorax, width .24 mm.; wing, length .75 mm., width at middle .045 mm. Length of antennal segments, I, 15 microns; II, 36; III, 48; IV, 42; V, 42; VI, 27; VII, 15; VIII, 30; total length 255 microns.

Head 1.5 times as wide as long and .2 longer than prothorax; dorsal surface distinctly reticulate only along posterior margin, without conspicuous spines. Eyes prominent, not protruding, occupying slightly more than half the length of the head, with large facets, pilose. Ocello approximate. Antennæ twice as long as head, typical of the genus in shape.

Prothorax with indistinct reticulations, without prominent spines except a pair of rather short transparent ones on each posterior angle. Wings fully developed, seventeen times as long as width at middle, fore vein fused with costa beyond fork; costa with nineteen to twenty prominent spines and without fringe; principle vein with two spines near base and two near fork. The first three are transparent and inconspicuous, the fourth is at the fork and dark brown. One spine at fusion of anterior vein with costa and two on inner side of costa near tip, the distal one being within the darkened band and dark brown. Posterior vein with four spines, the first and third are within the white areas, and are transparent, the second is within the median brown band and is dark brown, the fourth is within the outer white area but dark brown (female paratype with six spines on posterior vein).

Abdomen broadly ovate, pointed at tip, segments one to eight striate laterally and with a comb arrangement of spines along posterior margins at sides. Four long spines on posterior margin of segment nine, the inner pair 54 m. long, the outer ones 78 m. Segment ten without dorsal suture, terminal spines short and weak.

Male, allotype. Color as in the female, except that the darkened wing bands are less pronounced and there is more brownish shading in the lighter areas. Light impressions on ventral side of segments three to seven long and narrow, extending almost entirely across sternal plates. Segment nine with one pair of short stout dorsal spines near median line and two pair of longer spines near posterior margin, the inner pair of which are longer than the outer.

Described from seven female and three male specimens taken at **Phoenix, Arizona**, in August, 1926, by Mr. J. H. O'Dell, from cotton plants, and at **Calexico, California**, in September, 1926, by Mr. E. A. McGregor, from citrus foliage. All types in author's collection (Reg. Nos. 1155, 1413).

This species may be distinguished from *H. phaseoli* Hood, as follows: in *gossypii* the antennæ are about twice as long as the head, and head is .2 longer than prothorax; wings have three darkened cross bands and are about seventeen times as

long as width at middle; in *phaseoli* the antennæ are 2.4 times as long as the head, head and prothorax of equal length, and wings thirteen times as long as width in middle. *H. gossypii* may be distinguished from *indicus* Bagn., the cotton thrips of India, by its lighter body color, smaller size, more slender wings, and different sculpturing.

ODONTOTHRIPS CALIFORNICUS Moulton, 1907

This species was originally described as a variety of Haliday's *Odontothrips (Thrips) ulicis*. Dr. H. Priesner's recent studies (Ref. Die Thysanopteren Europas, 1926, Part I, p. 222), show that the "*ulicis*" Haliday's group have two strong teeth at the end of the fore tibiæ, while the "*lati*" Hal. group has only one tooth and the second is represented by a bristle-bearing wart. *O. californica* Moulton belongs to the second classification and the name "*ulicis*" is misleading and therefore withdrawn. This species is closely related to *O. lati* Hal.

Rhopalandrothrips corni Moulton, new species

Female, holotype. Color pale yellowish white, pterothorax slightly orange-yellow. Antennæ: segments one, two, basal half of three, and basal third of four, yellowish white, distal half of three light grayish brown, outer half of four and five to eight dark grayish brown. Wings transparent, veins yellowish white, prominent spines brown. Crescents of ocelli bright orange.

Measurements: Total body length .83 mm. Head, length .066 mm., width .11 mm.; prothorax, length .083 mm., width .13 mm.; pterothorax width .166 mm. Length of antennal segments, I, 15 microns; II, 30; III, 45; IV, 37; V, 30; VI, 45; VII, 9; VIII, 12; total length 225 microns.

Head transverse. Eyes prominent, protruding, facets large, pilose. Ocelli well developed. Interocellar spines prominent 39 m. long and placed near inner anterior margin of posterior ocelli. Mouth cone long, pointed, reaching beyond posterior margin of prosternum. Antennæ almost three times as long as head, five smallest and six largest of intermediate segments.

Prothorax with two long spines on each posterior angle (39 m.) and a third pair (30 m.) along posterior margin. Wings well developed reaching tip of the abdomen, veins clearly defined, with three cross veins between costa and fore vein, one opposite forking of longitudinal veins, one near middle of wing, and the other at the tip where fore vein fuses with the costa broadly in two or three places. Posterior vein ending abruptly just before the tip. Costa bearing seventeen to nineteen spines, fore longitudinal vein with five at base and two at extreme tip, posterior longitudinal vein with

nine to ten evenly placed. Ninth abdominal segment with a row of six long spines (60 m.) along posterior margin. Tenth segment with a pair of long median spines near the tip (69 m.) and a shorter pair on the sides (45 m.).

Allotype, male. Color as in the female. Total body length .56 mm. Length of antennal segments, I, 15 microns; II, 33; III, 33; IV, 30; V, 21; VI, 84; VII, 9; VIII, 12; total length 237 microns.

Head conspicuously transverse with eyes large, rounded and occupying almost the entire side of the head. Ocelli fully developed. Sixth antennal segment four times as long as segment five and nearly three times as long as segments three and four. Prothoracic spines as in the female but shorter. Wings fully developed surpassing tip of the abdomen, veins and spines as in the female. Ninth abdominal segment with a row of six long spines along posterior margin.

Described from twenty female and eight male specimens taken at Big Trees, **Calaveras County, California**, in August, 1926, by the writer from the foliage of dogwood and maple and from *Bromus* sp. All types in author's collection (Reg. Nos. 967, 968, 970).

The female of this species is very similar to *Tæniothrips costalis* Jones, but smaller, .83 mm., as compared with 1.33 mm. in *costalis*, and by the long-pointed mouth cone. Jones describes the mouth parts of *costalis* as "short and blunt." The enlarged sixth antennal segment places this species clearly in Priesner's *Rhopalandrothrips*, and this is the first member of this genus to be recorded from California.

LIOTHRIPS VARICORNIS Hood, 1912

A collection of five specimens of thrips taken at Marysville, California, in December, 1926, by Mr. H. A. Crane, from hollyhocks, can be assigned to the species *varicornis* Hood, with the following notations: Antennal segments three, four, five, and six distinctly shorter than as given in the original description, and with a median longitudinal streak in the hind wings as in the fore pair, fading just before the tip. Otherwise, the specimens in this collection are apparently identical with *varicornis*; blackish brown in color with only the third antennal segment abruptly yellow and the longitudinal bars of the fore wings extending to near the tip. This thrips has been known heretofore only from Monterey, Mexico, taken from weeds and grass.